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10/601,348	06/23/2003	Pascal Audinot	TIF-33831	1230
23494	7590	08/20/2008	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			HANNON, CHRISTIAN A	
ART UNIT	PAPER NUMBER			
	2618			
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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uspto@dlemail.itg.ti.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/601,348	<b>Applicant(s)</b> AUDINOT ET AL.
	<b>Examiner</b> CHRISTIAN A. HANNON	<b>Art Unit</b> 2618

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 20 May 2008.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1,4,6,7,13-21 and 25-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1,4,6,7,13-21 and 25-35 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/SB/06)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_

### **DETAILED ACTION**

This action is response to applicant's response filed on 5/20/2008. Claims 1, 4, 6-7, 13-21 & 25-35 are now pending in the present application. **This action is made final.**

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
  - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
2. Claims 1, 4, 6-7, 13, 19-21 & 25-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson et al (US 7,103,116), hereinafter Thompson in view of Chen (US 6,831,957).

Regarding claims 1 & 7, Thompson teaches a receiver and related method comprising analog-to-digital circuitry for generating a digital representation, comprising a bit signal, of an amplified analog signal at an input (Figure 5, Item 518; Thompson) adjustable gain control circuitry for receiving a radio signal and outputting the amplified analog signal using a gain determined connected directly to the bit signal at an output of the analog-to-digital circuitry (Figure 5, Items 513 & 513a; Column 7, Lines 41-43, 46-47, 50-53; Thompson) and digital channel filtering circuitry for filtering said digital representation (Figure 5, Item 530; Thompson) and digital processing circuitry for processing the output of said digital channel filtering circuitry (Figure 5, 'Pilot Magnitude

Multiply Unit'; Thompson), furthermore Thompson teaches that a raw bit signal may be used to control a gain (Column 7, Lines 41-43, 46-47, 50-53; Thompson) however Thompson fails to explicitly teach wherein the gain is adjusted by a first amount responsive to a first bit selected from a plurality of most significant bits in the bit signal, the first bit indicating that the output of the analog-to-digital circuitry has exceeded a first threshold, wherein the gain is adjusted by a second amount responsive to a first set of bits selected from the plurality of most significant bits in the bit signal, the first set of bits indicating that the output of the analog-to-digital circuitry has exceeded a second threshold, wherein the first amount is not equal to the second amount, and wherein the first threshold is not equal to the second threshold. Chen teaches that different bit patterns may be utilized to control different levels of gain in such a manner that neither the bit patterns nor the levels of adjustment, that is to say 'thresholds', are the same (TABLE 1; Figures 2-4; Column 3, Lines 63-67; Column 4, Lines 1-67 [particularly lines 49-56]; Column 5, Lines 1-3; Chen). The Chen teaching of the Ggain = Max being taught when a MSB changes from a '0' to a '1' is of significant interest here, as shown in Figure 4 of Chen. Therefore it would be obvious to one of ordinary skill in the art to combine the teachings of Thompson and Chen as Thompson provides no explicit detail as to how to digitally implement the digital gain changes it would be reasonable for one of skill in the art to look to any known manner to implement such a teaching.

Regarding claim 4, Thompson and Chen teach the receiver of claim 1 wherein said adjustable gain control circuitry adjusts said gain independent of said digital processing circuitry; as shown Thompson teaches no DSP processing in controlling the

AGC circuit (Figure 5, Items 513 & 513a; Column 7, Lines 41-43, 46-47, 50-53; Thompson).

Regarding claims 6, 32 & 35, Thompson and Chen teach the receiver of claims 1, 7 & 13, wherein said gain is adjusted by a third amount responsive to a second set of bits selected from the plurality of most significant bits of said bit signal, the second set of bits indicating that the output of the analog to digital circuitry is below a third threshold. Chen teaches a four bit control scheme which obvious to one of skill in the art would allow for 16 control words, thereby any number of thresholds up to this amount is rendered obvious in conjunction with Thompson's teaching of bit controlled gain adjustment.

Regarding claim 13, Thompson and Chen teach a receiver as shown above in regards to claim 1. The applicant has utilized claim 13, in what appears to be an attempt to further limit the control bit to a single bit. However as the use of a single bit is used in conjunction with 'a plurality of most significant bits' it can only be understood that the claim is drawn to a single bit control within a plurality of bits. Therefore as shown in the instance of Thompson when the MSB changes from '1' to a '0' this limitation is taught as only a single bit sample is used for control. Therefore claim 13 is rejected in light of this idea in conjunction with the analogous limitations from claim 1 as rejected above.

Regarding claim 19, Thompson and Chen teach claim 13, wherein said adjustable gain control circuitry comprises two gain control circuits whereby both sensitivity and interference tests may be conducted. Chen teaches that a duplication in parts would be reasonable to better suit a multi-band device, thereby applying the same

teachings of Thompson in conjunction with Chen's multi-path device it would be obvious to one of ordinary skill in the art to duplicate the gain control taught by Thompson in both a first receive band and second receive band as taught by Chen (See Figure 1 Chen).

Regarding claims 20 & 25, Thompson and Chen teach claims 13 & 1, respectively, with a single bit control directly connected to the gain control circuitry (See claim rejections for claims 1 & 13).

Regarding claim 21, Thompson and Chen teach claim 13, wherein said adjustable gain control circuitry comprises two gain control circuits whereby both sensitivity and interference tests may be conducted. Chen teaches that a duplication in parts would be reasonable to better suit a multi-band device, thereby applying the same teachings of Thompson in conjunction with Chen's multi-path device it would be obvious to one of ordinary skill in the art to duplicate the gain control taught by Thompson in both a first receive band and second receive band as taught by Chen (See Figure 1 Chen).

Regarding claims 26, 27 & 28, Thompson and Chen teach claim 1, 7 & 13, wherein said gain is adjusted by the first amount using the output of the ADC without intervention from the digital processing circuitry if the output of the ADC is close to saturation over the first threshold, as shown Thompson and Chen utilize no DSP intervention (Figure 5, Items 513 & 513a; Column 7, Lines 41-43, 46-47, 50-53; Thompson).

Regarding claims 29, 31 & 34, Thompson and Chen teach claims 1, 7 & 13, wherein both the first and the second amounts represent a decrease in the gain. Thompson teaches that "a relatively constant amplitude is achieved by AGC 513 processing the digital samples produced at the output of the ADC 518 to produce a correction signal to VGA 513a to adjust the degree of amplification" with that said it is obvious that in the case where the digital sample was to large the 'correction signal' would be a decrease command to the VGA.

Regarding claims 30 & 33, Thompson and Chen teach claims 1 & 7, wherein the third amount represents an increase in the gain. Thompson teaches that "a relatively constant amplitude is achieved by AGC 513 processing the digital samples produced at the output of the ADC 518 to produce a correction signal to VGA 513a to adjust the degree of amplification" with that said it is obvious that in the case where the digital sample was to small the 'correction signal' would be a decrease command to the VGA. In light of Chen's 16 possible control words, it would be obvious to program the circuit in order to account for weak signals as is widely known in the art.

3. Claims 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson in view of Chen and further in view of Axness et al (US 2004/0072547), hereinafter Axness.

Regarding claim 14, Thompson and Chen teach the receiver of claim 13, however fail to teach wherein said adjustable gain control circuitry is coupled to receive

an output signal from at least one low pass filter. Axness teaches that a receiver may utilize a LPF, as is commonly known in the art (Page 2, [0025]; Axness). Therefore it would be obvious to include a LPF in the teachings of Thompson and Chen in order to provide for a filtered signal thereby creating a higher quality signal.

Regarding claim 15, Thompson, Chen & Axness teach claim 14, wherein at least one input of said at least low pass filter is coupled to an output of at least one mixer (Page 2, [0025]; Axness).

Regarding claim 16, Thompson, Chen & Axness teach claim 15, wherein at least one input of said at least one mixer is coupled to an output of an amplifier (Page 2, [0025]; Figure 3, Item 133; Axness).

Regarding claim 17, Thompson, Chen & Axness teach claim 16, wherein an input of said amplifier is coupled to an output of a bandpass filter (Figure 3, Items 132, 133; Axness).

Regarding claim 18, Thompson, Chen & Axness teach claim 14, wherein said at least one low pass filter comprise two low pass filters (Items 145, 146; Axness).

#### ***Response to Arguments***

4. Applicant's arguments with respect to the previous set of pending claims have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTIAN A. HANNON whose telephone number is (571)272-7385. The examiner can normally be reached on Mon. - Fri. 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nguyen Vo/  
Primary Examiner, Art Unit 2618  
08/16/2008

/C. A. H./  
Examiner, Art Unit 2618  
August 5, 2008